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THE BRYOLOGIST

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APPEARANCE OF MOSSES IN ECOLOGICAL HABITATS

ARAVILLA MEEK TAYLOR

In the June, 1920, number of the Botanical Gazette there appeared an article by the present writer upon the Ecological Succession of Mosses in the Chicago Region. [1] In the following table will be found an alphabetical list of mosses collected during that work, arranged according to the ecological habitats in which they were found.

In order to avoid repetition and to reduce the table to the smallest scope possible, the climax beech-maple forest habitat has been given only once, but the reader should understand that in the region east of Chicago the beech-maple seems to be the climax or ultimate forest association in all successions whether they originate on dune sand, morainal clay, rock, or in water habitats. [2] The oak forest may appear as a stage in any series and will differ little if at all in content on the various substrata.

For explanation of ecological terms the reader is referred to the work of Dr. Cowles[2], and for a detailed description of the region to the article in the Botanical Gazette. I wish also to express my greatest appreciation of the kindness of Mrs. Elizabeth Britton, Mr. George B. Kaiser, and Dr. A. LeRoy Andrews in the determination and verification of the mosses.

The south and west shores of Lake Michigan give us a unique floral habitat. We find here the meeting place of species typical of the north, the south, the east and the west. What is true of the higher plants is also true to a great extent of mosses. While the Middle West is not usually thought of as a typical moss habitat, yet of the 81 species given, all but three have been found within a radius of a few miles of Chicago. The list is by no means complete owing to the fact that it was not possible in some cases to obtain material sufficiently good for identification in the time given to the work. Many regions afford greater total quantity of moss but probably few offer greater variety within so small an area. It is hoped that publication of the present list may lead to the addition of other species by future workers in the same territory.

The succession of mosses varies in much the same way as that of herbaceous plants. Certain xerophytic types appear as pioneers on bare sand or clay.

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[1] TAYLOR, ARAVILLA M. The Ecological Succession of Mosses in the Chicago Region. Bot. Gaz. **69**: 449-491. 1920.

[2] COWLES, HENRY C. The Plant Societies of Chicago and Vicinity. Chicago, 1901.

The September number of THE BRYOLOGIST was published December 2, 1920.

TABLE SHOWING ECOLOGICAL HABITATS

The letter "P" indicates that the species is present in the given habitat.

Species	Dune Sand				Moraine			Rock		Bog				Swamp					Climax Forest	
	Cottonwood	Pine	Early Oak	Late Oak	Beach Slope	Ravine	Oak Upland	Exposed	Sheltered	Fen	Shrub	Tamarack	Oak-Yellow Birch	Open Pond	Pond Margin	Early Swamp Forest	Late Swamp Forest	Iron Stream	Beech-Maple Ravine	Beech-Maple Upland
Amblystegiella adnata (Hedw.) Nichols.						P			P											
Amblystegium irriguum (Wils.) B. & S.																		P		
radicale (Beauv.) Mitt.																P	P	P		
riparium (L.) B. & S.						P						P		P						
serpens (L.) B. & S.									P						P					
varium (Hedw.) Lindb.						P									P			P		
Anomodon attenuatus (Schreb.) Huebn.			P			P														
rostratus (Hedw.) Schimp.		P	P		P		P		P				P			P	P		P	
viticulosus (L.) H. & T.									P											
Aulacomnium heterostichum (Hedw.) B. & S.			P			P														
palustre (L.) Schwaegr.											P									
var. polycephalum (Brid.) B. & S.										P						P				
Bartramia pomiformis (L.) Hedw.			P			P			P											
Brachythecium acuminatum (Hedw.) Kindb.						P			P								P			
acutum (Mitt.) Sull.															P					
cyrtophyllum Kindb.			P						P											
digastrum (C. M.) Kindb.		P				P			P											
oxycladon (Brid.) J. & S.					P	P			P								P			
var. dentatum (L. & J.) Grout									P											
plumosum (Sw.) B. & S.						P														
rivulare B. & S.										P	P	P				P	P	P		
rutabulum (L.) B. &. S.									P							P	P			
Bryhnia Novae-Angliae (S. & L.) Grout						P										P				
Bryum affine (Bruch) Lindb.					P															
argenteum L.			P					P												
caespiticium L.			P																	
capillare L.		P					P													
pendulum (Hsch.) Schimp.															P					
ventricosum Dicks.	P		P												P					
Calliergon cordifolium (Hedw.) Kindb.										P	P	P					P			
Schreberi (Willd.) Grout		P				P														
Campylium chrysophyllum (Brid.) Bryhn.															P					
hispidulum (Brid.) Mitt.										P			P							
stellatum (Schreb.) Bryhn										P	P	P			P					
Ceratodon purpureus (L.) Brid.	P	P	P	P			P	P												
Catharinaea undulata (L.) W. & M.		P	P	P			P						P							P
Climaceum americanum Brid.			P			P	P	P				P				P	P			
Kindbergii (R. & C.) Grout														P	P					
Cratoneuron filicinum (L.) Roth																		P		
Dicranella heteromalla (L.) Schimp.						P			P											
Dicranum scoparium (L.) Hedw.		P					P					P				P				

TABLE SHOWING ECOLOGICAL HABITATS

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Drepanocladus aduncus (Hedw.) Warnst.										P	P	P		P	P			P		
fluitans (Dill.) Warnst.														P	P					
intermedius (Lindb.) Warnst.																P				
Elodium paludosum (Sull.) Loeske												P								
Entodon cladorrhizans (Hedw.) C. M.					P				P			P					P		P	P
seductrix (Hedw.) C. M.									P											
Fissidens cristatus Wils.		P	P						P			P								
Funaria hygrometrica (L.) Sibth[1]			P				P	P	P				P			P		P		
Grimmia apocarpa (L.) Hedw.								P	P											
Gymnostomum rupestre Schleich.									P											
Hylocomium triquetrum (L.) B. & S.		P																		
Hypnum molluscum Hedw.																	P			
Leskea obscura Hedw.							P													
Leucobryum glaucum (L.) Schimp.		P	P				P					P				P				
Mnium cuspidatum (L.) Leyss.			P			P	P		P			P				P	P		P	
Philonotis fontana (L.) Brid.									P			P			P	P				
Physcomitrium turbinatum (Michx,) Brid.							P													
Plagiothecium denticulatum (L.) B. & S.						P	P									P				
deplanatum (Schimp.) Grout						P														
Platygyrium repens (Brid.) B. & S.																			P	
Polytrichum commune L.		P	P				P				P					P	P			
var. perigoniale (Michx.) B. & S.											P									
Rhodobryum roseum (Weis,) Limpr.		P	P						P											
Sphagnum palustre L.											P	P								
recurvum Beauv.											P									
subsecundum Nees.																P				
Stereodon arcuatus Lindb.															P	P	P			
Haldanianus (Grev.) Limpr.												P		P			P			
Thelia asprella (Schimp) Sull.					P															
Lescurii Sull.			P	P																
Thuidium abietinum (L.) B. & S.		P	P																	
delicatulum (L.) Mitt.		P	P		P		P	P				P				P	P			
microphyllum (Sw.) Best							P												P	
recognitum (Hedw.) Lindb.		P	P									P				P	P			
Tortella caespitosa (Schwaegr.) Limpr.			P																	
tortuosa (L.) Limpr.		P	P																	
Tortula mucronifolia Schwaegr.									P											

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[1] The habitat iron stream" in the case of the *Funaria* is really partially submerged sticks around the outlet and upon tufa mounds wet by the seepage from the spring.

These are usually followed by more mesophytic mosses which in time may be entirely crowded out in the competition with herbaceous plants. In the dune region at the head of Lake Michigan we find near the shore what is known as the cottonwood dune, because the cottonwood, *Populus deltoides* Marsh., is the first tree to make a successful growth upon the nearly bare sand. As the dune grows older, or as we go further from the lake among the older dunes, we find that the cottonwood has given place to the Jack pine, *Pinus Banksiana* Lamb. The pine dune is later replaced by an association of red, white, and black oak, the last oak succession being in some places a pure stand of *Quercus alba* L. As with the higher plants, so in like manner with the mosses, we may trace a succession in these tree habitats.

In the rock series the first plants are lichens, or, in very moist places, liverworts, which are then succeeded by pioneer mosses and these in turn by other mosses or herbaceous plants. In the water series, floating mosses may occur in open water, and along the margin, partly submerged, are the same or related species. As the surface mat is formed in the deeper lakes various types of hydrophytic mosses are abundant in the fen (sedges—bulrush—cat-tail) association. In the shrub and early tree associations new mosses take the place of the pioneers as in the other cases.

One of the most noticeable facts brought out by the entire study is the great reduction in number of species in the late oak and climax forests, which appears in marked contrast to the conditions found in many regions.[1] The forest floor in all the forests under consideration is nearly free from fallen logs; hence, any mosses must compete with herbaceous plants for possession of the ground. In the ravines, logs and stumps are more common, and here we find a somewhat greater abundance of mosses.

CORVALLIS, OREGON.

APLOZIA PENDLETONII PEARSON

WM. HY. PEARSON

Since I wrote my description of the above species[2], I have received from Mr. Pendleton several packets of the same species, with a note: "In fruit when collected." I have not been able to find any trace of fruit, which probably disappeared in the process of drying, but there are numerous perianths. What I described in my note as immature, are evidently normal-sized and perfect perianths. Their smallness, only about half the size of the bracts (perianth .75 mm. x .5 mm., bracts 1.25 mm. x .5 mm.) by which they are entirely hidden, affords another good character for this remarkable species. The folds are more

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[1] COOPER, WM. S. The Ecological Succession of Mooses on Isle Royale, Lake Superior. Plant World **15**: 197–213. 1912.

[2] Pearson, Wm. Hy. *Aplozia Perdletonii*, n. sp. BRYOLOGIST **23**: 50 52. (Pl. II, including 8 figs.) 1920.

Straits Settlement, *see* Java.
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ERRATA

Page 5, line 27, for east read west.
Page 9, line 5, for *Barbellla* read *Barbella.*
Page 62, line 15, for *bonjeani* read *Bonjeani.*
Page 66, line 3 from bottom, for *antarctici* read *antarctica.*
Page 82, line 5 from bottom, for *Climaceum* read *Climacium.*
Page 87, line 10 from bottom, for MEGAPOLITANA read MEGAPOLITANA.